Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2014

Marking Scheme

Technical Graphics

Higher Level

Note to teachers and students on the use of published marking schemes

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.
Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.
In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

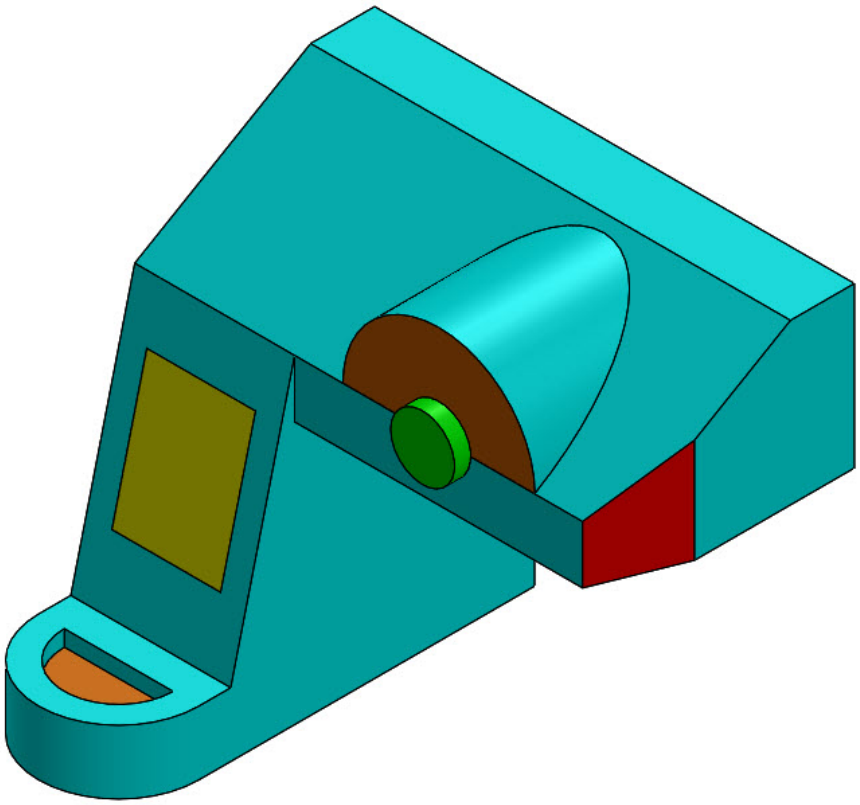
Future Marking Schemes

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate Examination, 2014

Technical Graphics



Higher Level
Marking Scheme

Sections A and B

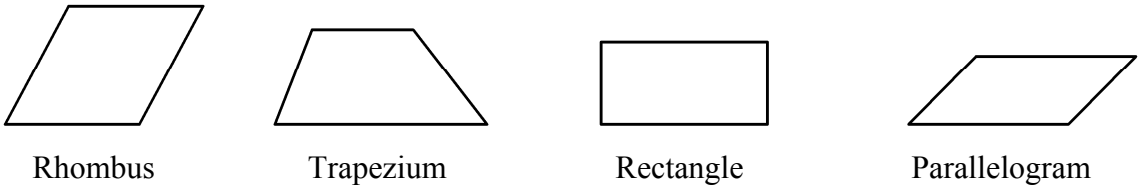
***Section A** – any **ten** questions from this section*

***Section B** – any **four** questions from this section*

***Section A** – any **ten** questions from this section*

Q1	12	Four diagrams, 3 marks for each correct label.		
Q2	12	Six lines, 2 marks each		
Q3	4	A = 72°		
	4	B = 108°		
	4	C = 46°		
Q4	3	Base		
	3	Upstand		
	4	Platform		
	2	Colour or Shade		
Q5	4	Arcs with centre **L**		
	4	Identifying points		
	4	Completing figure		
Q6	6	Bisect (3), draw semi-circle (3)		
	2	Project **Z** axis		
	4	Elevation position		
Q7	3	Projecting perpendicular to X1Y1		
	2	Marking heights in auxiliary view		
	7	Completing light (5), Hidden detail (2)		
Q8	8	Component depicted in a <u>good quality</u> freehand pictorial sketch.		
	4	Appropriate shading or colour.		
Q9	12	Trim, Mirror, Extrude, Fillet (4 marks for each correct term)		
Q10	2	Drawing **FP** and **F1P**		
	3	Determine half major axis; length (2), bisect (1)		
	3	Draw major (1) and minor (2)		
	4	Draw semi-ellipse		
Q11	5	Draw and Bisect one chord		
	7	Draw and Bisect second chord (5), Locate centre (2)		
Q12	12	Two axes, 6 marks each		
Q13	4	Project points from plan (2) and end view (2)		
	4	Clothes bank outline		
	4	Clothes hatch		
Q14	2	Vertical line from $\mathbf{B_1}$	3	Establish ratio **AB** to $\mathbf{AB_1}$
	3	Radiating lines from A	2	Find required lengths
	5	Complete magnet	5	Complete magnet
	2	Colour or Shade	2	Colour or Shade
Q15	8	Four sectors		
	4	Colour or Shade		

1.



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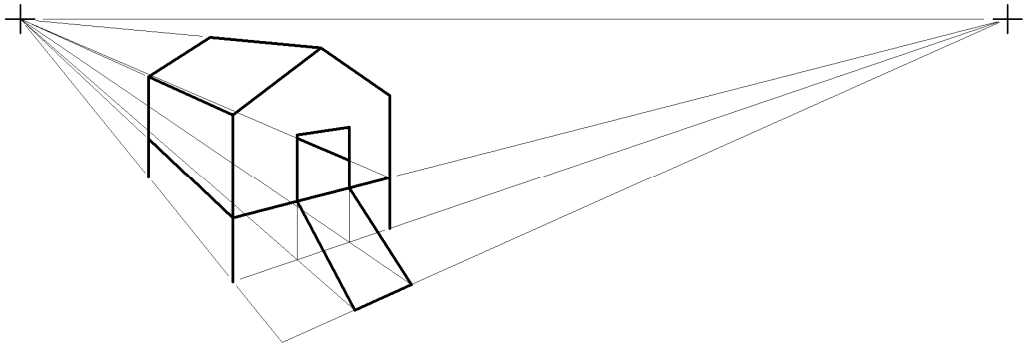

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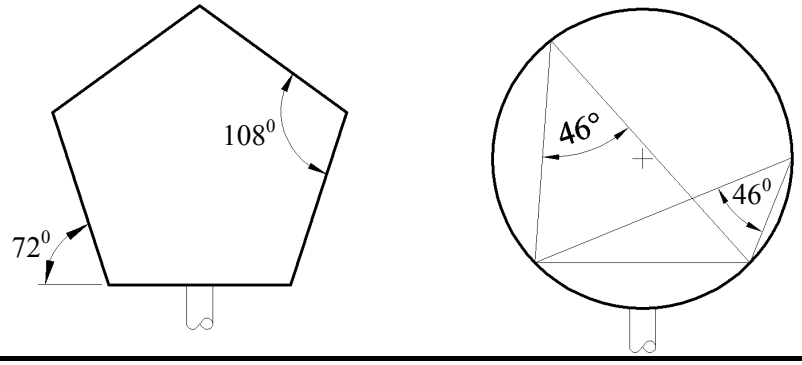

A = 72°

B = 108°

C = 46°

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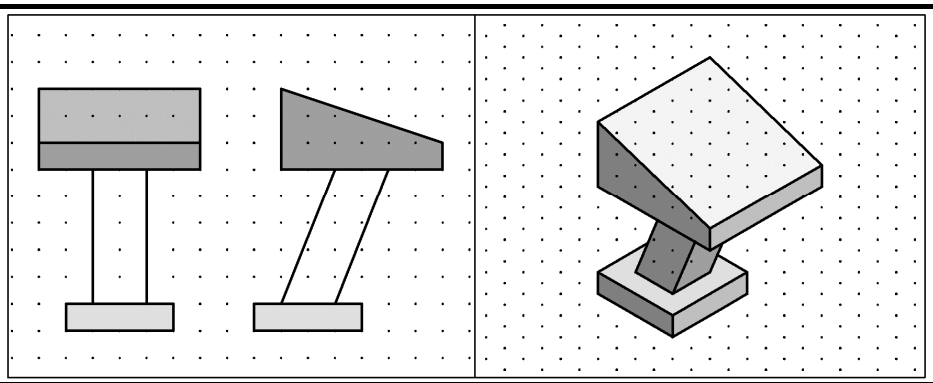

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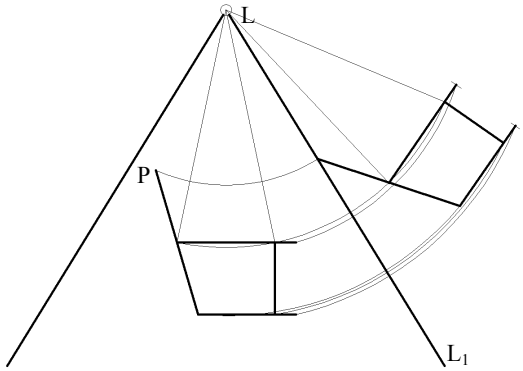

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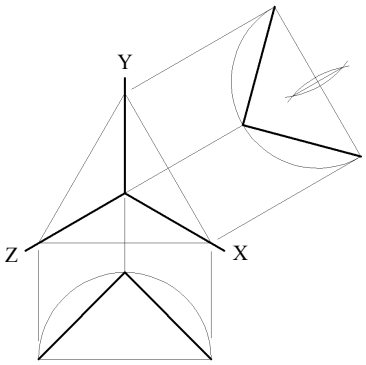

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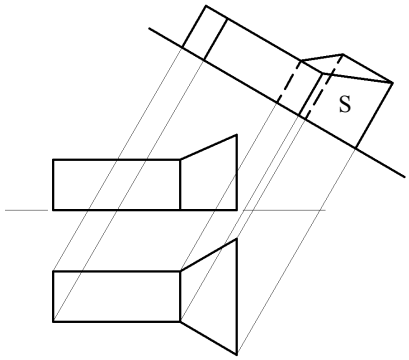

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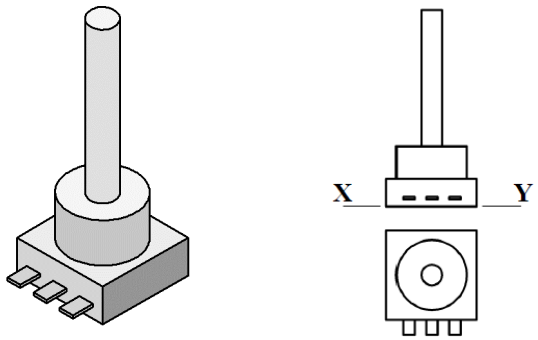

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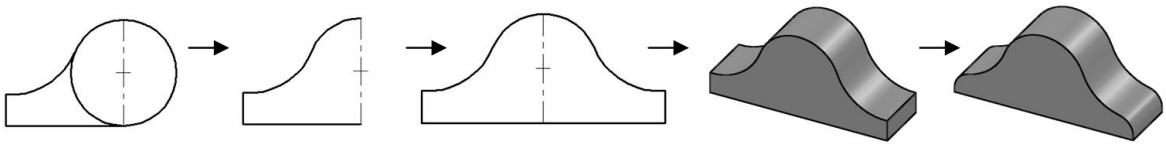

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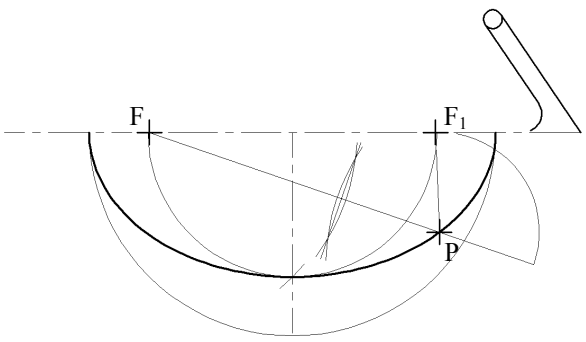

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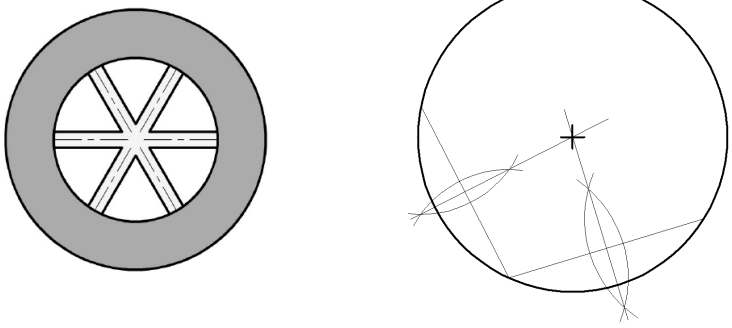

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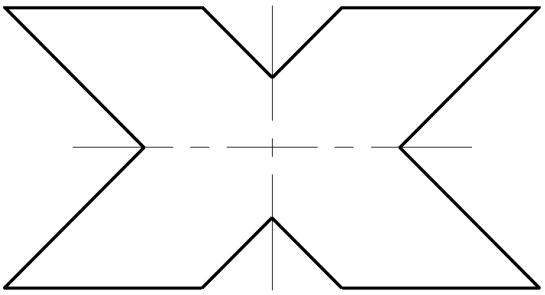

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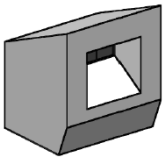

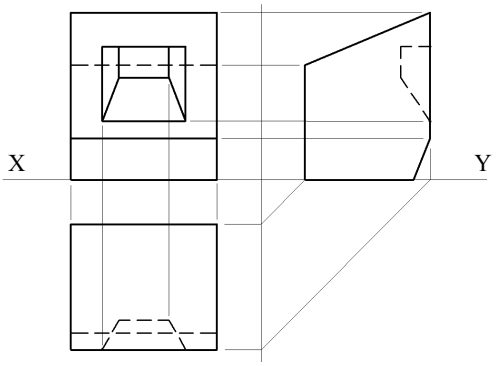

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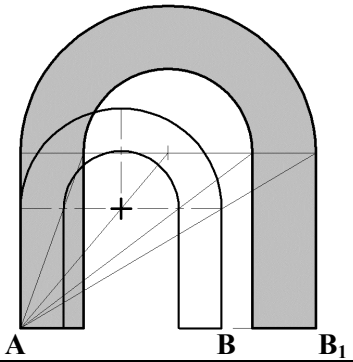

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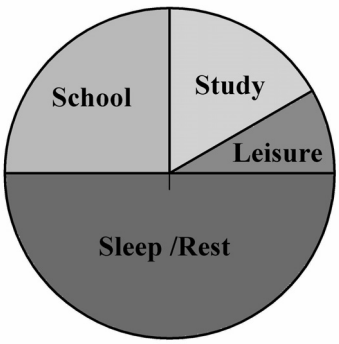
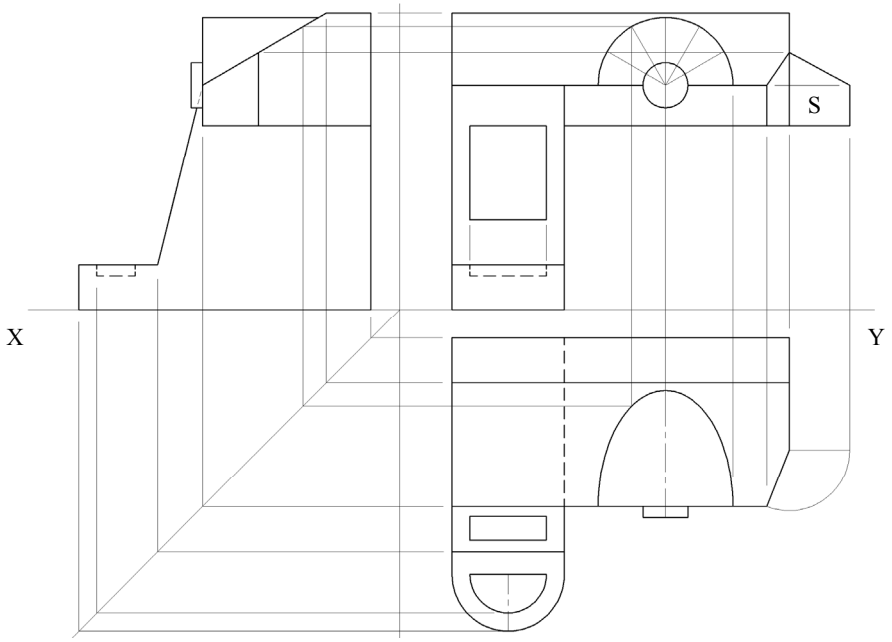


S*ection B – any **four** questions from this section*

The descriptions, methods and definitions in the scheme are not exhaustive and alternative valid answers are acceptable. If you are unsure of the validity of an alternative answer, contact your advising examiner.

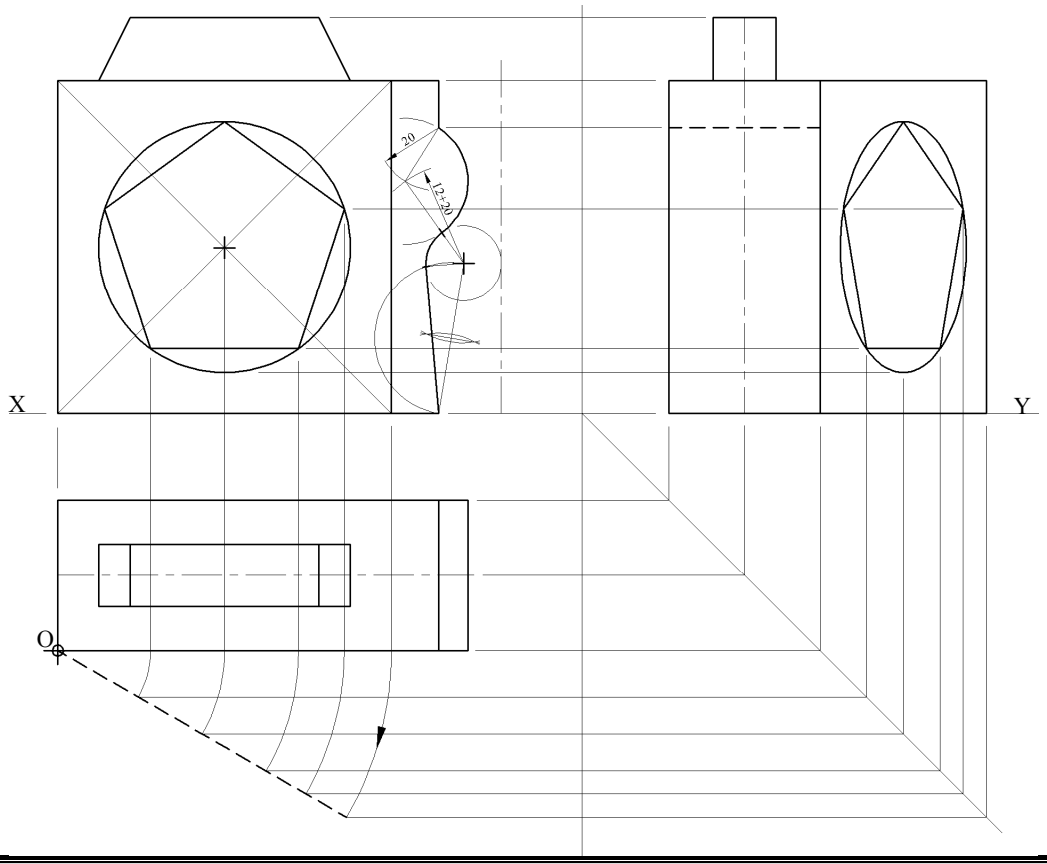
Q.1 – Orthographic projection.



	Elevation (18)	
8	Dashboard outline	
3	Circular arcs	
2	Centre panel	
3	Determine Surface S	
2	Hidden detail	
	Plan (20)	
6	Dashboard outline	
3	Semi-circles	
2	Centre panel	
2	Steering wheel mount	
6	Elliptical curve. Points in elev, project to EV, project to plan. Draw (1,1,2,2)	
1	Hidden detail	
	End View (14)	
8	Lines	
4	Cylinders	
2	Hidden detail	
	True Shape (8)	
	Rotate in plan	Project perpendicular
8	Project from plan (3), project height (2), completion (3)	New xy lines (3), transfer heights (2), completion (3)
10	**Drafting, accuracy, presentation**	

Total Marks 70

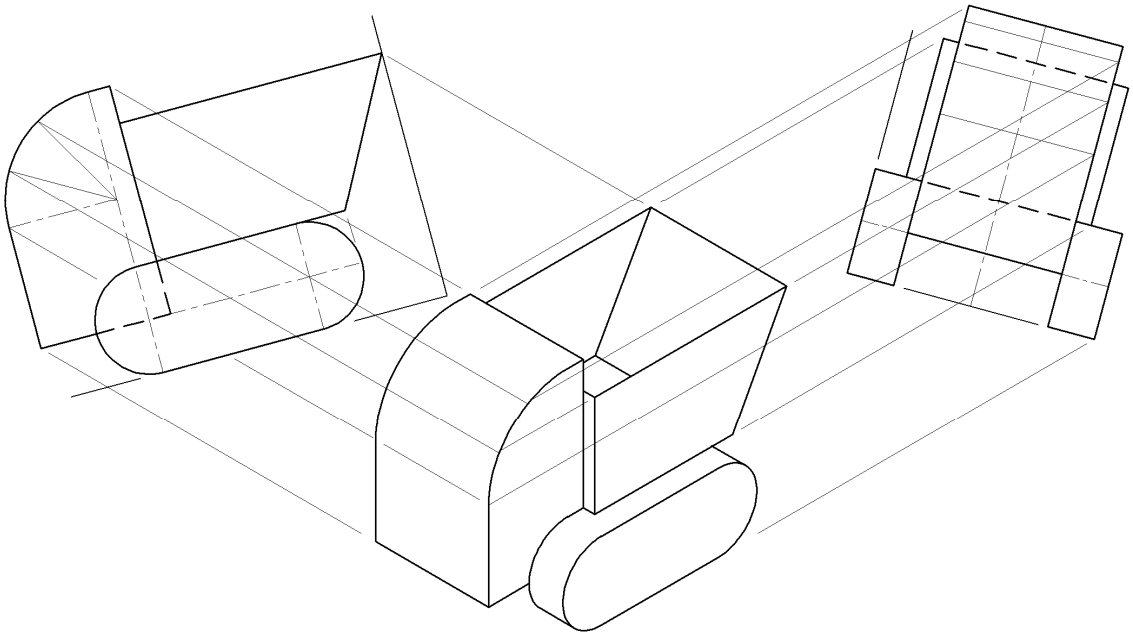
Q.2 - Orthographic, Rotation, End View.



	Given Elevation (26)
6	Outline of lunchbox
6	Locate and draw R12 (2), Tangent (4)
3	R20 circle
3	Completion bottle holder
8	Circle (3), Pentagon (5)
	Given Plan (12)
8	Outline (5), handle (3)
4	30° line (2), correct length (2)
	New Figure (22)
2	Projection of points to plan
2	Rotation of points in plan
2	Projections from plan to new figure in end view
2	Projections from elevation to new figure in end view
4	Outline of lunchbox
2	Rotated cover
6	Ellipse
2	Pentagon
10	**Drafting, accuracy, presentation**

Total Marks 70

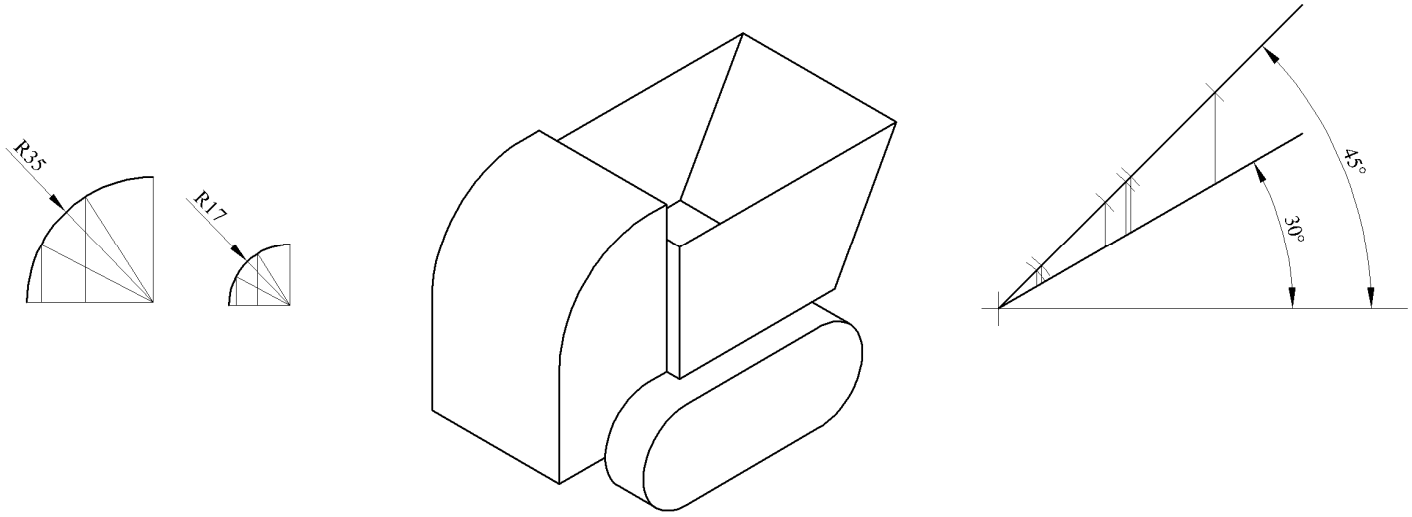
Q.3 (a) - Isometric Projection (Axonometric Axes Method)



Axonometric Axes Method	
	Elevation (16)
6	Tracks outline
7	Cab and hidden detail
3	Bucket
	End View (10)
4	Tracks outline
4	Cab (2) and bucket (2)
2	Hidden detail
	Completion of Isometric Projection (34)
9	Tracks
8	Cab outline
6	Cab curves
11	Bucket
10	**Drafting, accuracy, presentation**

Total Marks 70

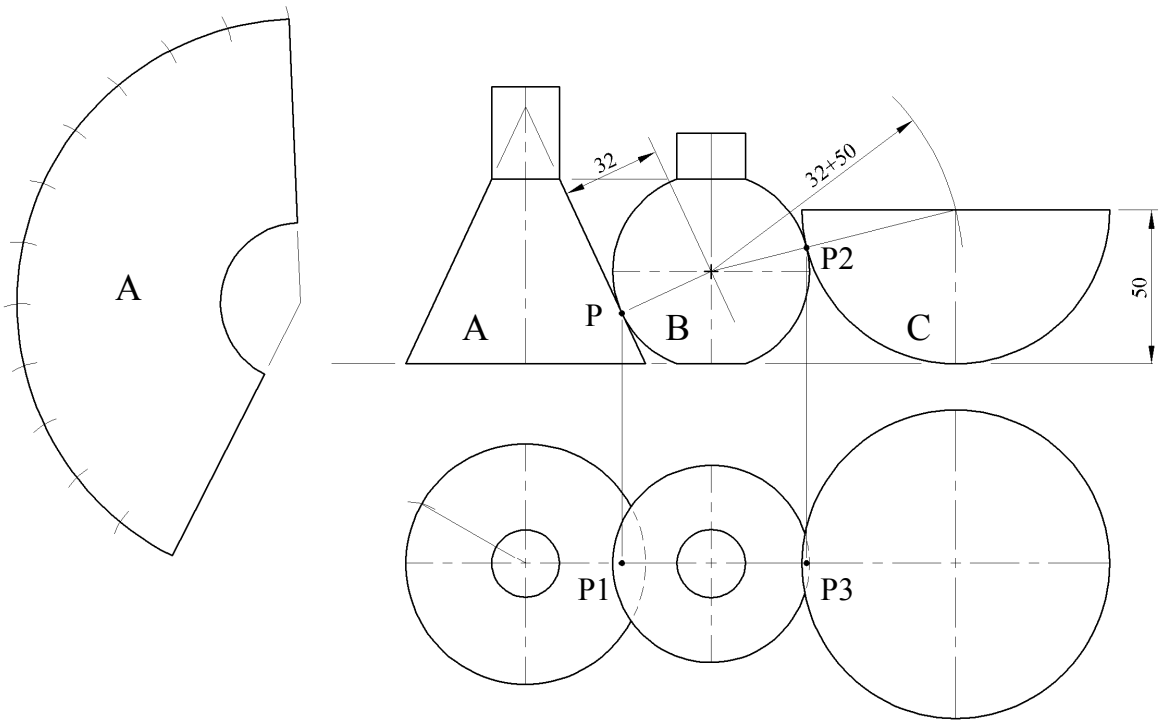
Q.3 (b) - Isometric Projection (Isometric Scale Method)



Isometric Scale Method	
	Isometric Scale (11)
4	Setting up isometric scale (2 marks for 30º line and 2 marks for 45º line)
4	Applying dimensions on 45º line
3	Projecting from 45º line onto 30º line
	Constructions for truck (9)
3	Apply scaled measurements required for the truck
6	Construction required for arcs (3,3)
	Isometric Projection (6)
6	Direction of axes (2,2,2)
	Completion of Isometric Projection (34)
9	Tracks
8	Cab outline
6	Cab curves
11	Bucket
10	**Drafting, accuracy, presentation**

Total Marks 70

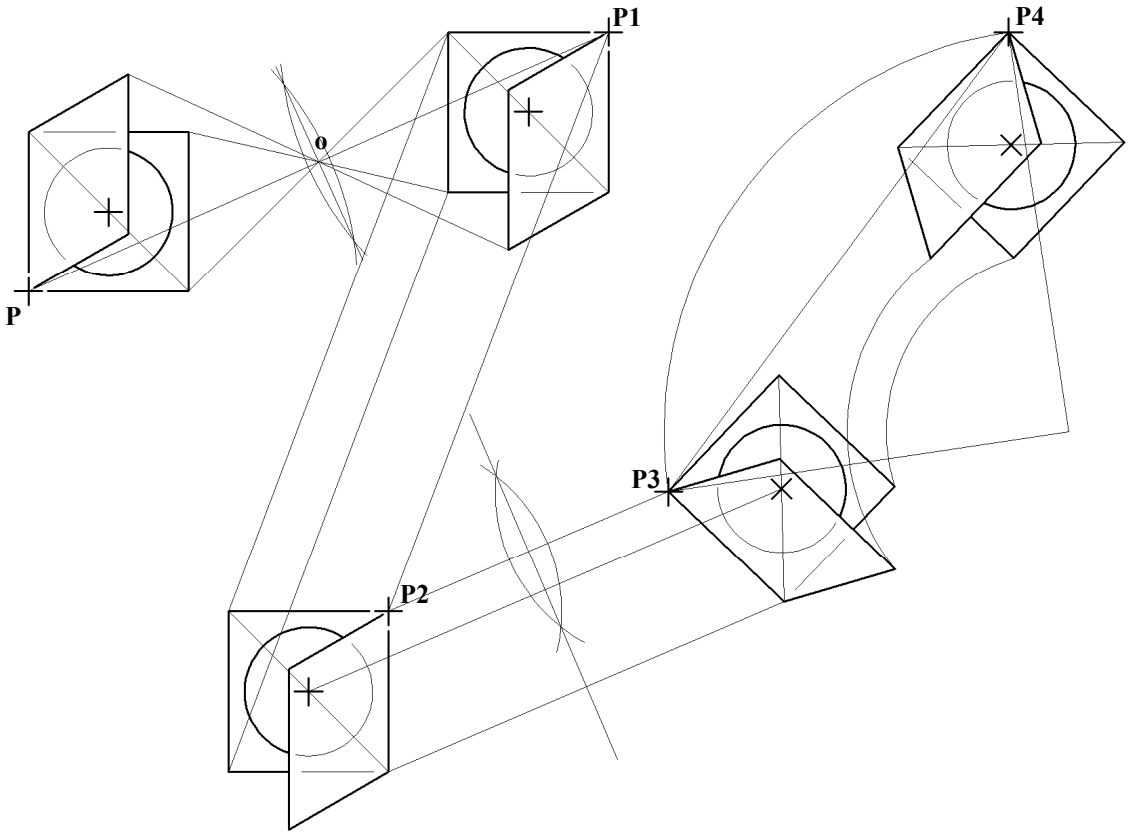
Q.4 – Solids in Contact / Development



	Elevation (24)
6	Conical vessel A
11	**Spherical vessel B**: height of centre (1), locate sphere centre (3), draw sphere (2), complete (5)
7	**Hemispherical bowl C**: height of centre (1), locate sphere centre (3), draw hemisphere (2), line (1)
	Plan (12)
4	Conical vessel A
4	Spherical vessel B
2	Hemispherical Bowl C
2	Hidden detail.
	Development of cylindrical surface A (16)
2	Determine length of extreme generator
2	Swing arc equal to extreme generator
6	Stepped out length of developed curve (3 correct increment, 3 correct no.)
2	Swing arc equal to frustum
4	Drawing the required development
	Points of Contact (8)
8	P, P1, P2, P3
10	**Drafting, accuracy, presentation**

Total Marks 70

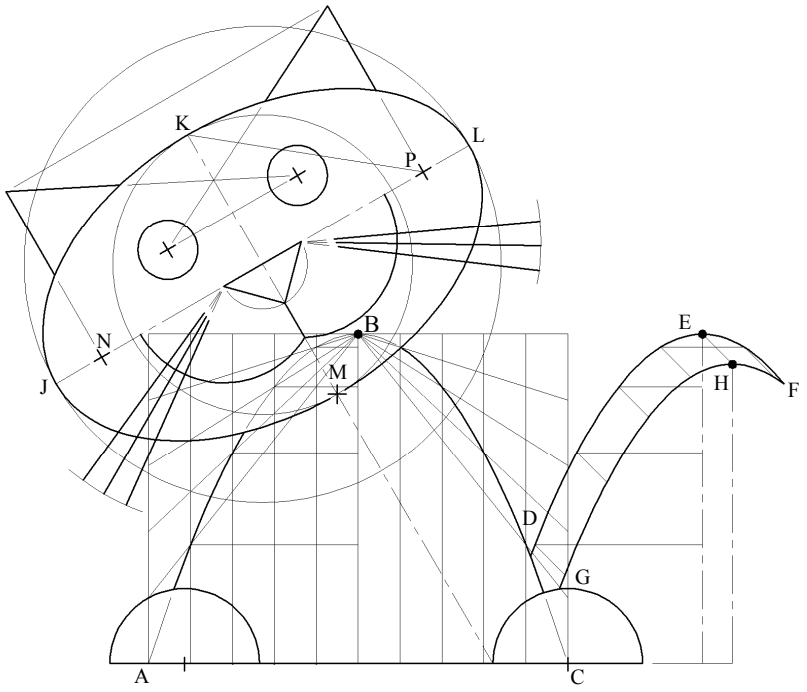
Q.5 - Transformation Geometry



	Setting up (8)
4	Construction outline
4	Complete figure
	Central Symmetry (12)
4	Locate pt **O** (2), project lines through **O** (2)
4	Locating key image points
4	Drawing the image figure accurately
	Translation (12)
4	Lines projected parallel to P1 – P2.
4	Locating key image points.
4	Drawing the image figure accurately.
	Axial Symmetry (12)
4	Projecting perpendicular to symmetry line. (Deduct 2 marks if not perp.)
4	Locating key image points.
4	Drawing the image figure accurately.
	Rotation (16)
4	Locating centre of rotation. (Joining **P3** to **P4** and applying 45° angles).
4	Drawing arcs
4	Locating key image points.
4	Drawing the image figure accurately.
10	**Drafting, accuracy, presentation**

Total Marks 70

Q.6 - Ellipse and Parabola



	Parabola (11)	
8	Construction to determine points on the parabola (2,2,2,2)	
3	Drawing of parabola **ABC**	
	Locate ellipse position (4)	
2	Semi-circular paws	
2	60^0 axis position and locate point **M**	
	Ellipse (21)	
6	Locate minor circle, major axis and focal points	
5	Determine major axis length **NM** or **PM** and draw major circle	
6	Locating additional points on the curve (2, 2, 2)	
4	Drawing the curve **JKLM**	
	Translation of parabola (14)	
1	Identify point **E**	
3	Identify ordinates for points on curve **ABC**	Translate points parallel to **BE**
2	Draw the curve **DEF**	
1	Identify **H**	
3	Identify ordinates for points on curve **ABC / DEF**	Translate points parallel to **EH**
2	Identify **F**	
2	Draw the curve **GHF**	
	Completion face (10)	
6	Eyes (2), Ears (2) Nose (2)	
4	Face (2), whiskers (2)	
10	**Drafting, accuracy, presentation**	

Total Marks 70